

CALIFORNIA STATE DEPARTMENT OF PUBLIC HEALTH

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Weekly Bulletin



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EDITOR

Municipal Refuse Problems and Procedures

(Continued from last issue)

Thirty-four cities reported the weights of mixed refuse collected. Most of these were estimates, as only a few places had accurate records. The average weight was 1.13 tons daily per 1000 population, or 824 lb. per capita per year. Eleven cities reported on the weight of garbage alone, the average being 0.39 tons daily per 1000 population and 284 lb. per capita per year. Ten cities reported on refuse only, averages being 0.58 ton daily per 1000 population and 424 lb. per capita per year. Only three cities reported on swill, the average being 0.092 tons daily per 1000 population, or 67 lb. per capita per year.

DISPOSAL METHODS

The most common methods of disposal reported are the combination of feeding swill or swill and garbage to hogs, with disposal of other refuse by dumping on land or burning on dumps. A survey by the Bureau of Sanitary Inspectors of the California State Department of Public health in 1930, showed that of 242 cities in the State, 192 had private collection and disposal and 48 had municipal collection and disposal. In 162 cases, wet garbage was used for hog feed, and the other refuse was deposited in designated dumps; in 68 cases all the refuse was deposited on designated dumps; in 7 cases incinerators were provided; and in 3 cases refuse was disposed of at sea.

Smaller cities generally dispose of municipal refuse by promiscuous dumping. As the community grows

and civic pride is awakened, improvements are made, first by confining the dumping to restricted areas, later by the use of deep fills, with plank runways for trucks, and sometimes by the feeding of hogs on the dump and burning the more combustible materials. These simpler methods are nearly always unsatisfactory on account of odor and smoke nuisances, flies, rats, and other rodents. They always create an eyesore, particularly if the dump is within sight of any public road. Eventually the public demands improved disposal methods.

In logical sequence the next step in improvement is the development of the "sanitary fill" or fill-and-cover method. Occasionally material is burned before being covered, but the general practice is to cover the material each day, at least on top, and at times on the face. The depth of fill material is from 5 to 25 feet, and the cover, from 6 inches to 2 feet or more. If this method is carefully controlled, care being taken to keep a small exposed face and to spread and smooth the finished surface, it may be employed to reclaim low-lying areas for such uses as parks, recreation fields, golf courses, and airports. Areas so reclaimed are generally not suited to become building sites.

The Commissioner of Public Works at Fresno, Cal., after a careful survey of methods used in other cities throughout the State, reported that the fill-and-cover method "properly handled is as good as incineration,

costs about one-third, and further does not require a large outlay of money." He proposes the use of the method on flat land, excavating three feet deep to get material for cover, dumping eight feet deep, using two feet of top cover, and covering the side slopes at least twice a week. The dump location at Fresno is at least a half mile from the nearest farmhouse.

INCINERATION

Municipal incinerators appear to have been more widely publicized than any other disposal method, and general opinion seems to favor them from the viewpoint of sanitation. However, experience indicates dissatisfaction with incineration, chiefly because of high cost, inadequate capacity, and resulting unsatisfactory performance. More specifically, the objections to it are that unburned or partly burned refuse must be dumped, with resulting odor nuisance and fly and rat menace. An incinerator, to operate successfully, should be used 24 hours a day, at a fairly uniform temperature and charging rate. This condition is seldom attained in practice because collections are generally made during the day time, and the great bulk of material arrives within a short period of time. The inevitable result is either an accumulation of unburned material on the charging floor or the overloading of furnaces, or both.

Four cities reported disposal of all or part of their mixed refuse by incineration. In Fresno, Cal., private collection and disposal will be supplanted by municipal service in October, 1934, and the incineration method will be abandoned for the fill-and-cover. Five cities reported disposal of combustible refuse by incineration. In all of them an attempt is made to have materials segregated. Vancouver incinerates 8 tons out of a total of 214 tons of refuse handled daily; Portland 75 tons out of 237; and Los Angeles, 100 tons out of 780.

DUMPING AT SEA

One of the oldest methods of waste disposal is dumping in bodies of water. The return of floating solids to the shore has been the cause of numerous complaints, and in California has resulted in a State law prohibiting the discharge or dumping of garbage into navigable waters or the Pacific Ocean within 20 miles of the shore. Many years ago Oakland, Cal., disposed of garbage by dumping from barges at sea, but the method was abandoned because in rough weather the trip across the bar at Golden Gate could not be made safely with the boat then used. Garbage dumped inside the Gate floated back to near-by shores. The ship and crew of 9 men were lost at sea in 1916, and the fill-and-cover method was used on the harbor

front until 1925, when disposal at sea was again adopted.

Victoria, B. C., also dumps mixed refuse at sea, although the more combustible material is disposed of in a burner. Bellingham, Wash., reported disposal of mixed refuse three miles from shore in Bellingham Bay, an arm of Puget Sound. Port Angeles, Wash., reported disposal of mixed refuse to the straits of Juan de Fuca where the tidal sweep is reported to carry it away.

HOG FEEDING A FAVORED METHOD

Conservation of food values in garbage was widely publicized during the World War, and the method is widely used, particularly for swill from restaurants and hotels. Most of the cities in southern California dispose of garbage as well as swill by the hog-feeding method. One report states that no other method is used by the 44 municipalities in Los Angeles County. Important features of successful hog-feeding systems are delivery of garbage in a fresh condition, feeding on concrete floors, and the daily clean-up and prompt disposal of waste and manure. Cities using this method have collections at least twice weekly. Los Angeles County has an ordinance requiring a permit for hog farm locations and making feeding on concrete floors obligatory. Disposal of wastes and manure has been the most troublesome feature, yet of the 37 farms operating in Los Angeles County in 1930, complaints were registered against only two. In one of these cases carelessness was the cause, as the owner was giving up the business.

Hog feeding is a private enterprise in all cases reported. Wide variations are found in financing. In some instances the general franchise or contract includes garbage and swill with all refuse; in some, a special contract is awarded for garbage collection only; in some, the contractor buys garbage at a flat rate per ton; and in some, the rate is based on the price of hogs, and no payment is made when the price falls below a stated amount. Still others provide further that the city will pay for garbage removal if the price drops below another stated amount. During periods of prosperity, some cities have received considerable sums for their garbage contracts, but in recent years receipts have dwindled. In some cases it has been necessary to pay the hog feeder to continue in business. Since swill has a higher food value than household garbage, most cities receive an income from this source, although in some cases the hotels and restaurants are paid directly by the hog-feeding company for the materials collected.

Hog feeding of garbage and swill from Los Angeles by the Fontana Farms Corporation in San Bernar-

dino is of such interest that a brief statement of the methods used is pertinent. From 400 to 600 tons daily are brought to the farm in a train of steel gondola cars. Garbage is fed to 46,000 hogs within a fenced area of 220 acres. The farm is divided into four units: the brooder unit, including farrowing pens and small pig pens; the weaning unit; the feeder unit; and finally, the fattening unit. The garbage is classified and fed in the following way. That from restaurants and hotels, comprising 25 per cent of the material received, is fed to finishing hogs, and that from households, making up the remaining 75 per cent, is fed to brooders. Garbage for the feeder and fattening units is fed from cars, that for other units, from trucks and wagons.

All feeding is done on concrete floors. Those in the feeder and fattening units are cleaned daily by a mechanical floor cleaner, and those in the other units, by hand. Railroad tracks are on concreted runways and are washed daily, the drainage being used for irrigation. Since this has been found too concentrated for crops, in the future it will be mixed with other water. Farrowing pens are cleaned daily and are washed and disinfected between broods at intervals of from three to four weeks. Earth pens are cleaned about once a month by raking the refuse into piles and then shoveling it into trucks. The manure from these pens contains a large amount of dirt and sand and makes a low-grade fertilizer, which is not sold but used on the company's property.

PROBLEM OF DISPOSAL OF WASTE FROM HOG FARMS

The most perplexing problem is the disposal of waste and manure from the concrete feeding floors. At first this was composted, but the odors were terrific, fly breeding was very troublesome, and the material composted very slowly, requiring large storage capacity. The present method is to spread it in a layer on concrete platforms constructed for the purpose. There it is turned by plow and treated with lime or gypsum to assist in drying and odor control. After it has been dried, it is piled; glass and bones are picked out from a belt; iron is magnetically removed; and finally it is ground and screened through a 1-inch by $\frac{3}{4}$ -inch screen. It is then sold by the ton as commercial fertilizer.

Five thousand tons of low-grade fertilizer are produced each year, and 20,000 tons of the commercial fertilizer. The latter has a moisture content of 5 or 10 per cent and a nitrogen content of 2 to 2.5 per cent. The company owns the adjoining land on all sides. The nearest neighbor is a quarter of a mile distant. Under present conditions, the pork produced averages 44.55 lb. per ton of garbage. Before

the depression, when more food was wasted as garbage, as high as 65 to 70 lb. of pork per ton were produced. This is said to be the largest hog farm in the world.

DISPOSAL COSTS SUMMARIZED

Less information is available on costs of disposal than on any other phase of the problem. In most reports received it is not clearly stated whether such items as interest, depreciation, replacements, and supervision are included. Reported costs of collection and disposal vary from \$1.40 per ton for garbage only, at Glendale, to \$7.85 per ton for mixed refuse at San Jose, Cal. In general, the cost for collection is far greater than that for disposal. In a survey of municipal garbage disposal by the Los Angeles County Live Stock Department in 1930, the average cost of garbage collection in 62 cities throughout the United States was found to be \$2.94 per ton. No average was figured in the present survey because the data are not comparable.

The lowest cost for disposal was reported by Sacramento, Cal., where comprehensive cost data on the fill-and-cover method give a total of 18.9 cents per ton. At Berkeley, with the same method, the cost is reported as 31.5 cents per ton. Disposal at sea for Victoria, B. C., costs about 30 cents per ton. At Oakland, Cal., ocean disposal was let by contract at 65 cents per ton, so that the cost was probably somewhat less than this amount. Costs for incineration are reported by Vancouver, B. C., as \$1.38 per ton; by Spokane, Wash., as about 90 cents per ton; and by Los Angeles, Cal., as \$1.46 per ton. The latter city also reports capital charges of \$1.38 per ton, giving a gross cost of \$2.84 per ton.

In conclusion, it is desired gratefully to acknowledge the cooperation of the city engineers and other officials who so kindly furnished the data presented here. Most helpful cooperation in the preparation of this report has been given by Charles Gilman Hyde, M. Am. Soc. C. E.

"This human life is only a perpetual illusion; people do nothing but deceive and flatter one another. No one speaks of us in our presence as he speaks of us in our absence. The union that exists among men is based only on this mutual imposition; and few friendships would survive if each one knew what his friend says of him behind his back, although he then speaks sincerely and without passion."—Blaise Pascal, Chapter VIII.

On the broad and firm foundation of health alone can the loftiest and most enduring structures of the intellect be reared.—Horace Mann (1845).

MORBIDITY**Complete Reports for Following Diseases for Week Ending October 27, 1934****Chickenpox**

134 cases of chickenpox have been reported, as follows: Alameda County 2, Berkeley 1, Hayward 3, Oakland 25, San Leandro 2, Contra Costa County 4, Kern County 1, Kings County 2, Los Angeles County 1, Alhambra 1, Avalon 1, Glendale 1, Long Beach 1, Los Angeles 11, Pomona 1, Madera 3, Marin County 1, Fairfax 1, Monterey 1, Pacific Grove 2, Riverside 3, Sacramento 5, Rialto 1, San Diego County 1, San Diego 1, San Francisco 35, Stockton 1, San Luis Obispo 1, Burlingame 1, Santa Barbara County 1, Santa Barbara 1, Santa Clara County 3, Palo Alto 1, San Jose 1, Siskiyou County 3, Suisun 1, Petaluma 2, Stanislaus County 1, Tulare County 1, Ventura County 5.

Diphtheria

43 cases of diphtheria have been reported, as follows: Alameda County 5, Oakland 4, Alhambra 1, Los Angeles 20, Redondo 1, Merced County 3, Merced 1, Fullerton 1, Riverside 1, San Bernardino County 1, San Diego County 1, San Diego 1, Stockton 1, Santa Clara County 1, San Jose 1.

German Measles

15 cases of German measles have been reported, as follows: Berkeley 2, Placerville 1, Kings County 1, Los Angeles 4, Pasadena 1, Santa Ana 1, Tustin 1, Ontario 1, San Diego 1, San Francisco 1, Santa Maria 1.

Influenza

19 cases of influenza have been reported, as follows: Amador County 1, Los Angeles County 3, Los Angeles 9, Orange County 3, San Luis Obispo County 1, Santa Cruz 1, Tulare County 1.

Malaria

6 cases of malaria have been reported, as follows: Gridley 1, San Joaquin County 3, Lodi 2.

Measles

156 cases of measles have been reported, as follows. Alameda County 1, Oakland 2, Pittsburg 1, Fresno 1, Kern County 1, Hanford 1, Los Angeles County 2, Los Angeles 4, Maywood 1, Merced County 1, Napa 1, Placentia 1, Riverside 1, Sacramento 2, Ontario 1, San Diego 2, San Francisco 2, San Joaquin County 17, Stockton 13, Tracy 60, Santa Barbara County 2, Santa Maria 7, Santa Cruz County 1, Santa Cruz 9, Stanislaus County 1, Tulare County 9, Exeter 12.

Mumps

98 cases of mumps have been reported, as follows: Alameda County 1, Berkeley 1, Hayward 1, Oakland 5, Los Angeles County 1, Burbank 3, Glendale 1, Long Beach 4, Los Angeles 7, Monrovia 2, Madera County 1, Merced County 1, Placentia 1, Riverside 1, Sacramento County 1, San Bernardino County 7, San Diego 1, San Francisco 8, San Joaquin County 2, Lodi 9, Stockton 12, San Luis Obispo County 3, Santa Barbara County 3, Santa Maria 11, San Jose 1, Stanislaus County 3, Modesto 5, Tulare County 1, Exeter 1.

Pneumonia (Lobar)

29 cases of lobar pneumonia have been reported, as follows: Berkeley 2, Placerville 1, Fresno County 1, Los Angeles County 4, Los Angeles 7, Pasadena 1, Merced County 2, Riverside County 3, Sacramento 1, San Diego County 1, San Diego 1, San Francisco 1, Lompoc 1, San Jose 1, Sonoma County 1, Tulare County 1.

Scarlet Fever

214 cases of scarlet fever have been reported, as follows: Alameda 1, Albany 1, Berkeley 3, Oakland 5, Amador County 1, Colusa County 2, Pittsburg 2, Fresno County 6, Fresno 1, Reedley 1, Humboldt County 1, Kern County 8, Kings County 3, Hanford 1, Los Angeles County 14, Burbank 2, Compton 1, Culver City 1, Glendale 1, Huntington Park 1, Long Beach 8, Los Angeles 40, Pasadena 1, South Pasadena 1, South Gate 2, Gardena 1, Madera County 3, Merced 1, Monterey County 1, Pacific Grove 1, Orange County 4, Brea 1, Orange 1, Santa Ana 4, Placentia 2, Colfax 1, Plumas County 2, Sacramento County 4, Sacramento 4, San Bernardino County 4, Redlands 1, San Diego County 8, San Diego 7, San Francisco 10, San Joaquin County 11, Lodi 1, Stockton 6, Redwood City 1, Santa Barbara 2, Santa Clara County 1, Mountain View 1, San Jose 5, Suisun 1, Sutter County 1, Tulare County 2, Tuolumne County 2, Ventura County 8, Yolo County 1, Woodland 2, Yuba County 1.

Smallpox

No cases of smallpox have been reported.

Typhoid Fever

17 cases of typhoid fever have been reported, as follows: Oakland 2, Jackson 2, Fresno County 1, Imperial County 1, Brawley 1, Calipatria 1, Inyo County 1, Madera County 2, San Bernardino County 3, San Diego County 1, Modesto 1, Tulare County 1.

Whooping Cough

76 cases of whooping cough have been reported, as follows: Berkeley 9, Oakland 1, Contra Costa County 6, Humboldt County 2, Los Angeles County 5, Azusa 1, Burbank 2, Los Angeles 9, San Fernando 1, Torrance 2, Orange County 1, Placentia 2, Sacramento 2, San Diego County 5, San Diego 1, San Francisco 16, San Joaquin County 2, Stockton 2, Lompoc 3, Santa Barbara 1, Santa Maria 1, Palo Alto 2.

Meningitis (Epidemic)

2 cases of epidemic meningitis have been reported, as follows: Los Angeles 1, San Benito County 1.

Dysentery (Amoebic)

3 cases of amoebic dysentery have been reported, as follows: Los Angeles 1, San Francisco 1, Santa Barbara County 1.

Dysentery (Bacillary)

4 cases of bacillary dysentery have been reported, as follows: Alhambra 1, Glendale 1, South Gate 2.

Opthalmia Neonatorum

One case of ophthalmia neonatorum from Oakland has been reported.

Poliomyelitis

30 cases of poliomyelitis have been reported, as follows: Albany 1, Berkeley 1, Oakland 1, Chico 1, Fresno County 1, Kern County 3, Bakersfield 1, Los Angeles County 3, Hermosa 1, Inglewood 1, Long Beach 1, Los Angeles 8, Redondo 1, San Fernando 1, Orange County 3, Santa Clara County 1, Stanislaus County 1.

Trachoma

3 cases of trachoma have been reported, as follows: Los Angeles 1, Modoc County 1, San Diego 1.

Paratyphoid Fever

2 cases of paratyphoid fever have been reported, as follows: Los Angeles 1, San Francisco 1.

Trichinosis

5 cases of trichinosis have been reported, as follows: Sausalito 1, San Francisco 4.

Undulant Fever

One case of undulant fever from Modesto has been reported.

Coccidioidal Granuloma

One case of coccidioidal granuloma from Tulare has been reported.

Septic Sore Throat (Epidemic)

4 cases of epidemic septic sore throat have been reported, as follows: Colfax 1, Redwood City 1, Santa Clara 1, Sonoma County 1.

Relapsing Fever

One case of relapsing fever from San Bernardino County has been reported.

Psittacosis

One case of psittacosis from San Francisco has been reported.

Rabies (Animal)

16 cases of rabies in animals have been reported, as follows: Los Angeles County 6, Alhambra 1, Los Angeles 6, San Diego 3.

* * * We do not yet sufficiently realize the truth that as, in this life of ours, the physical underlies the mental, the mental must not be developed at the expense of the physical * * *.—Herbert Spencer (1860).

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